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ABSTRACT

A conference/workshop held in late 1979 which was aimed at improving the teaching of mathematics is reviewed. The conference was a response to the PRIME-80 conference of the Mathematical Association of America (MAA), which had produced recommendations that something should be done to reverse the decline of educational skills among entering college freshmen. The conference was viewed as a success by both the participants and the organizers. It was stated that many colleges can offer a conference of this sort in their own community that could focus on the particular needs and issues in mathematics education for the region. Such a conference can provide benefits that can far outweigh the small monetary outlay. (MP)

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"Math for the 1980's - A Response to the PRIME-80"

A Conference/Workshop at Augusta College

Ping-Tung Chang and Bill Bompart

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Rationale

The average SAT scores on both the verbal and mathematical sections have been dropping steadily for the past sixteen years.[1] The mathematics score was 502 in 1963 and in 1979 it was 467. The verbal score was 478 in 1963 and in 1979 it was 427. Does the decline result from the test instrument or the scoring method? The MAA Panel on PRIME-80[2] concluded that "the decline has not resulted from changes in the testing instrument or in the method of scoring it."[3]

If it is not the test instrument, then what are the reasons for the decline? The Panel concluded the possible causes involved two categories.[4]

The first category represents the decline from 1963 to about 1970 and reflects primarily the changes in the SAT-taking population--a larger population of characteristically lower scoring students from lower socio-economic strata, minority groups and women.

The second category starts in 1970, during which time the SAT-taking population has become more stable but the score continues to drop. The Panel believes (so do we!) that the following six sets of probable influences[5] might contribute to the decline of the score during this period:

1. Changes in high school courses of study--more electives, reduction of the number of traditional courses.
2. Changes in learning standards in the schools and society--increased absenteeism, grade inflations, automatic promotion from one grade to the next, less homework assigned and

SE 035 576

completed, easier textbooks.

3. Changes in the family--more one parent homes, more families in which both parents work, decline in the role of parent as teacher.
4. Television--by the age of 16 children have spent between 10,000 and 15,000 hours watching TV. This means a significant reduction in the time that might otherwise have gone into doing homework, into reading and writing, or into developing other skills and aptitudes measured on college entrance examinations.
5. Disruptive events in the nation during the period involved--political assassinations, the Vietnam War, corruption of national leadership, burning of cities.
6. A decline in student motivation--less motivation for learning in general and for preparing for the SAT in particular.

The alarming decline in SAT's underscores the deficiency of basic skills in all levels of educational systems. The failing of the three "R's" shows up in all types of school systems nationwide--city, suburban, rural.[6] In addition, the open admission of many community colleges and universities has caused an influx of students with a wide range of abilities. They are unprepared for college-level courses, and, in some community colleges, this group of students may be as large as one-third of the entering freshman class.[7] One area in which such students lack requisite skills is mathematics. Of course, it is our responsibility to determine how to increase the mathematical competence of the unprepared students. We believe that failure to provide the help to

increase the mathematical attainment of the large mass of human beings so frequently neglected or shunted aside not only allows the waste of human potential but also could be detrimental to the mathematical enterprise.[8]

Conference Organization

Because of the concerns listed above, it was felt that a conference for teachers would be appropriate in our community. The initial motivation was originated by Professor Ping-Tung Chang of the Special Studies Department of Augusta College, who became the conference director. Co-directors were Professor John W. Presley, Chairman of the Special Studies Department, Professor Jerry Sue Townsend, Chairman of the Department of Mathematics and Computer Science, Sharon Covitz, Acting Director of the Office of Continuing Education, Mrs. Margaret Rodgers, Assistant Superintendent for Instruction at Columbia County Schools and Mr. James Gorst, Principal, Curtis Baptist High School in Augusta. Professor Bill Bompart, Department of Mathematics and Computer Science, was designated Program Chairman.

Pre-planning

In order to bring responses to the PRIME-80's recommendations, we communicated with local school mathematics teachers in February of 1979. Mrs. Margaret Rodgers was one of the earliest to give her wholehearted support to the idea of a mathematics conference and even indicated her desire to use the conference as in-service for her county teachers. Several local mathematics teachers agreed that we needed a conference dealing with new ideas, new teaching methods, and what to teach in the 1980's. Penny Vaughn, Mathematics Coordinator of the

Richmond County School System told us that the conference would be a very worthwhile endeavor and should be beneficial to all participants.

During several pre-planning meetings, math teachers indicated their need to know how to deal with math anxiety among students. They complained that they cannot teach students who do not care or have a so-called "self-defeating" attitude. The teachers indicated they would like to know how:

1. To stimulate the students' interests in mathematics.
2. To teach lower level elementary school mathematics.
3. To teach remedial mathematics for seventh and eighth graders.
4. To individualize instruction using programmed texts or independent study.
5. To develop real world problem-solving strategies.
6. To familiarize the students with the mathematics of the 1980's.

During the final pre-planning meeting, we discussed how such a conference might best serve its intended audience. We wanted to appeal not only to the mathematics teachers but also to the parents, counselors, and other interested persons. It would be a conference involving everyone who wanted to know something about mathematics. At the meeting we concluded the following:

1. The conference would explore the issues and recommendations suggested by PRIME-80.
2. The conference would stimulate interest, curiosity, and participation.
3. The conference would emphasize alternative methods of teaching mathematics at the early childhood level and also the middle grade level.
4. The conference would encourage communication among mathematics

teachers at all levels--colleges, high schools, and elementary schools.

5. The conference would provide presentations related to overcoming math anxiety—for persons who have a history of fear and dislike of mathematics.

Goals

In light of the decisions reached at the pre-planning meeting and in order to serve the educational needs of teachers of mathematics, the conference listed the following goals:

1. Encouraging better communication among all levels of math teachers from elementary school through college.
2. Presenting new ideas and new strategies for teaching mathematics.
3. Providing basic survival skills in the 1980's.
4. Facing the issues and recommendations of PRIME-80.

Participants

In order to make the public aware of the long neglect of mathematics, the conference extended the invitation of participation to the following:

1. All school mathematics teachers (elementary, middle, high schools)
2. College mathematics teachers
3. Parents
4. School counselors, principals
5. All interested persons

Dean's Approval

A proposal for a "Math for the 1980's" Conference/Workshop was submitted and approved by Dr. J. Gray Dinwiddie, Dean of the College, on

March 21, 1979. The tentative date of the conference was set for October 12 and 13, 1979. The initial budget for this two day conference was less than three hundred dollars. It was agreed that there would be no registration fee for the conference.

The expenses for the main speaker of the conference were underwritten by a grant from the Cullum Foundation, a state-wide philanthropic organization which initiated a Visiting Scholar Program in January, 1968, at the College to enable it to invite to its campus outstanding men and women who are widely known in their respective fields. The Visiting Scholars provide lectures, seminars for faculty and students, addresses to the student body and to the public, and conferences in their field of expertise.

Naturally, a conference of this magnitude cannot be successful without the support of many interested factions of the educational community. This strong support was evidenced by the fact that the conference was sponsored jointly by the Department of Special Studies, the Department of Mathematics and Computer Science, the School of Education, and the Office of Continuing Education at Augusta College together with the Richmond and Columbia County School Systems.

Several prominent mathematics educators in Georgia and South Carolina were contacted and each agreed to come and be one of the conference sectional speakers or workshop leaders. Most of them were gracious in promising to come without financial assistance.

Main Speaker

The principle speaker for the conference was Dr. Mary P. Dolciani, Professor of Mathematics at Hunter College, CUNY. Dr. Dolciani spoke each morning of the conference and conducted an informal question and

answer session on Friday afternoon. Her talks were on minimum-competency examinations and "The Most Important Outcome of Mathematics Education." Dr. Dolciani was extremely well-received and her presentations were topics for conversation for months following the conference.

A. Edward Uprichard from the University of South Florida was to have spoken on methods and strategies for teaching mathematics to children with learning disabilities; however, illness prevented him from attending.

Our Program

Implementation of Recommendations of PRIME-80

To explore the issues and recommendations suggested by the PRIME-80, our conference offered 27 sessions which ranged from the early childhood level workshops for the elementary school teachers to the general interest sessions for anyone.

Sessions related to I. "Recommendations directed toward educational goals defined in terms of needed mathematical skills." (1) "Competency Exams and Their Effect on the Curriculum" (Mary P. Dolciani, Hunter College, CUNY); (2) "Projects For the Gifted Secondary Student" (Evelyn C. Bailey, Oxford College of Emory University); (3) "Geometric Concepts and Constructions" (Freddy Maynard, Augusta College); (4) "Understanding Area--Is the Formula Necessary or Sufficient?" (JoAnne Mayberry, Georgia College); (5) "Geoboard: An Application of the Pythagorean Theorem" (Lyle Smith, Augusta College); (6) "Problem Solving: Every Teacher's Goal" (Rosalie S. Jensen, Georgia State University); (7) "Geometry for the 1980's" (Thomas J. Brieske, Georgia State University); (8) "Individualized Instruction in Mathematics" (Stephen M. Preston, Georgia Department of Education); (9) "Teaching Measuring with Metric Units" (Clare F. Nesmith, Georgia Department of Education); (10) "Mathematics--More Than + and -"

(Brenda Cockrill Tapp, Metro-CESA, Atlanta); (11) "Alternate Strategies For Teaching Certain Concepts" (Bill Bompart, Augusta College); (12) "How to Enhance My Child's Mathematics Education" (Ruth Y. Sharrock, Lucy Laney High School, Augusta); (13) "Self-Regulated Mathematics Learning on the Microcomputer in the Primary Grades" (Karen A. Schultz, Georgia State University); (14) "Assessing Mathematics Achievement in the Middle Grades" (Wanda M. White, Georgia Department of Education); (15) "Class Encounters of the First Kind" (Everett Coker, Wills High School, Smyrna, Georgia, Georgia Star Teacher of the Year—1978); (16) "Computers in the Classroom" (Margaret E. Dexter, Augusta College); and (17) "Children Counting and Its Relation to Addition and Subtraction" (Leslie P. Steffe, University of Georgia).

Sessions related to II. "Recommendations directed to the establishment of college curricula to impart appropriate mathematical skills." (1) "Using Graphs to Improve Skills" (James M. Benedict, Augusta College); (2) "Mathematics for College Students" (Jerry Sue Townsend, Augusta College); and (3) "The Most Important Outcome of Mathematics Education" (Mary P. Dolciani, Hunter College, CUNY).

Sessions related to III. "Recommendations directed toward transition problems faced by students. Colleges are now admitting many students who have taken too few mathematics courses in high school or whose mathematical skills are inadequate for the normal beginning college courses." (1) "Overcoming Math Anxiety and Avoidance" (Joseph E. Cicero, Coastal Carolina College, South Carolina); (2) "Problem Solving in Remedial College Mathematics" (Tom Hall, Mercer University in Atlanta); and (3) A Conversation with Mary Dolciani.

Sessions related to IV. "Recommendations directed toward continuing education" and V. "Recommendations directed toward the organization and responsibilities of the mathematics profession": (1) "Mathematical Issues For the 1980's" (John P. Downes, Georgia State University); and (2) "Stargazing Into the Future" (Fredric Plachy, Clayton Junior College).

Session related to all Recommendations: Panel Discussion: "Topic: What Math for the 1980's?" (Moderator, Joseph E. Cicero, Coastal Carolina College, South Carolina. Panelists: George E. Ivey, Paine College, Augusta; Joe R. Johnson, Evans High School, Columbia County, Georgia; Alva S. Lewis, Douglas School, Trenton, South Carolina; Robert Phillips, University of South Carolina-Aiken; and Penny Vaughn, Richmond County Schools, Augusta, Georgia).

Reactions

The response of the teaching community was extremely gratifying. The conference registered about 525 participants from Richmond County, Columbia County, Atlanta, other cities in Georgia, and even from South Carolina, Alabama and Indiana. This number included teachers of mathematics at all levels, administrators, counselors, and parents. It is significant that there were more elementary school teachers than any other group. These elementary teachers almost never attend mathematics meetings; apparently they felt a need for what we had to offer. But even more encouraging than the large attendance was the fact that literally hundreds of the participants told us that it was one of the best conferences they had ever attended and that they were helped by attending. Every speaker was well-received and the formal evaluation forms which we requested people

to complete were 99% positive. Media coverage was good with features on Dr. Dolciani and a television interview with the program chairman.

Results

The conference provided a number of positive results. Some of these are:

1. It illustrated that many of the concerns of PRIME-80 are shared by the educational community.
2. It emphasized that teachers are not only willing but eager to attend meetings where they feel they can receive genuine help in improving their teaching.
3. It allowed teachers to question prominent mathematics educators, such as Dr. Dolciani, about issues pertinent to their individual situations.
4. It provided opportunities for teachers to communicate with teachers of other levels, especially elementary teachers.
5. It offered teachers new ideas concerning teaching and enabled them to discover what others around the state are doing.
6. It emphasized the importance of the teaching of basic skills for all students from the learning disabled to the gifted.
7. It provided parents the opportunity to know something of the mathematics their children are learning in school now and what they are likely to learn in the future and to see some of the problems and challenges that confront teachers in the schools.

Conclusions

We feel that many colleges can offer a conference of this sort in their community focusing on specific problems and issues in mathematics

education or responding to specific recommendations of PRIME-80 or even aiming at increasing math awareness at the grass-roots level. The conference need not be expensive and the benefits may far outweigh the small monetary outlay. Local meetings of this type will become, perhaps, more feasible than state or national meetings due to the current energy crisis.

A conference of the type described here must be planned in cooperation with local school systems and private schools. These schools know their needs and interests, can provide access to the schools' internal mail service, can promote attendance, and can even provide incentives to their teachers by offering staff development credit for attendance and/or participation.

A conference of this sort requires a great deal of work on the part of many people but the benefits seem to warrant this commitment from those of us who feel professionally obligated to do what we can to improve the teaching of mathematics.

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1. The College Board News, September, 1979.

2. The Mathematical Association of America, PRIME-80, Proceedings of a Conference on Prospects in Mathematics Education in the 1980's. This conference was held at the Olde Colony Conference Center in Alexandria, Virginia, April 30, 1978, to May 2, 1978.

3. The Mathematical Association of America, PRIME-80 Proceedings, p. 23.

4. Ibid., p. 23.

5. Ibid., pp. 23-24.

6. Patricia McCormack, The Three R's Take A Beating, The Atlanta Journal and Constitution, April 23, 1978, 10-A.

7. Charles R. Monroe. Profile of the Community College: A Handbook. San Francisco: Jossey-Bass, Inc., Publishers, (1972) 103-110. Cited by Ping-Tung Chang, On Relationships Among Academic Performance, Sex Difference, Attitude, and Persistence of Small Groups in Developmental College Level Mathematics Courses, Ph.D. Dissertation, Georgia State University, Atlanta, Georgia, 1977, p. 9.

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